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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ISSAC, ROY P	

ART UNIT	PAPER NUMBER
1623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/780,435	KROSS ET AL.	
	Examiner	Art Unit	
	Roy P. Issac	1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/24/07 has been entered.

This Office Action is in response to Applicant's amendment/ remarks/ response filed 10/24/07, wherein claims 1 has been amended and claim 21 has been newly submitted. Claims1-21 are currently pending and are examined on the merits herein.

Rejections Withdrawn

Applicants' amendment filed 6/25/07 in which the dependence in claims 12 and 12 were changed from claim 1 to 11 overcomes the objection to claims 12 and 13.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "said initial pH value of around 3.75 or lower" in line 4. (emphasis added). There is insufficient antecedent basis for this limitation in the claim. The initial pH value recited in line 3 is "pH value of around 3.75". Similarly claim 21 also recite "said initial pH....3.7 or lower" in reference to "pH ...3.7".

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-21 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant's amendment with respect to amended claims herein has been fully considered but is deemed to insert new matter into the claims since the specification as originally filed does not provide support for a "wherein the percent by weight of said metal nitrite in said composition ranges from about 0.01

to about 1.0". The original specification clearly discloses doses of "less than about 1.0, preferably about 0.01 to about 0.75, more preferably 0.03 to about 0.70, and even more preferably from about 0.05 to about 0.50 percent by weight of metal nitrite." (Specification, Page 11, Paragraph 2). The range now claimed "about 0.01 to about 1.0" is considered to the subgenus range of "less than about 1.0" as originally described. The Court of Appeals for the Federal Circuit held that "subgenus range was not supported by generic disclosure and specific example within the subgenus range"; See, e.g., *In re Lukach*, 442 F.2d 967, 169 USPQ 795 (CCPA 1971); the court also held that "a subgenus is not necessarily described by a genus encompassing it and a species upon which it reads" (see *In re Smith*, 458 F.2d 1389,1395, 173 USPQ 679, 683 (CCPA 1972). See also MPEP 2163. Consequently, there is nothing within the instant specification which would lead the artisan in the field to believe that Applicant was in possession of the invention as it is now claimed. See *Vas-Cath Inc. v. Mahurkar*, 19 USPQ 2d 1111, CAFC 1991, see also *In re Winkhaus*, 188 USPQ 129, CCPA 1975.

Response to Arguments

Applicant has not addressed the above rejection with respect to claims 1-20 in the response filed dated 10/24/07.

The claims are deemed properly rejected, and the rejection is adhered to.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Benjamin et. al.(U.S. Patent Publication No. 20020136750; Of Record).

Benjamin et. al. discloses acidified nitrite as an antimicrobial agent. (Page 1, lines 3-4). Benjamin et. al. further discloses that the acidification of nitrite produces nitrous acid. (Equation 1, Page 1, line 36). Benjamin et. al. discloses the use of nitrites below pH 4 and the use of metal nitrate as precursor for nitrite ions. (Page 3, lines 20-25). Benjamin et. al. discloses the use of acidified nitrites in carriers such as cream or ointment. (Page 3, lines 27-30). Note that ointment and cream are considered as gel. The acidified nitrite is disclosed for use in either liquid or tablet form. (Page 3, lines 35-36). Benjamin et. al. further discloses a method for sterilizing using acidified nitrite. (page 4, lines 1-10). Benjamin et. al. further discloses the use of citrate/phosphate buffer in which sodium nitrite was added to produce an acidified nitrite solution. (Page 5, Example 1). Benjamin et. al. further discloses the use of acidified nitrite solution against E.Coli. (Page 6, Example 2, lines 20-23). Benjamin et. al. discloses that

1mM concentration of nitrite solution can kill E.Coli completely. (Page 7, Example 3, lines 7-8). Benjamin et. al. further discloses the use of salicylic acid and sodium nitrite on patient feet with fungal infection. (Page 7, Example 5, lines 33-37). Note, that feet is considered mammalian tissue. Benjamin et. al. further discloses the use of acidified nitrites as mouthwash. (Page 8, Example 6, lines 8-14). Benjamin et. al. further discloses the sue of nitrite solution for sterilizing objects such as dentures. (page 2, lines 32-35). Note that, objects such as dentures are considered to have some partial metal surfaces. Since Benjamin et. al. discloses the use of citrate-phosphate buffer, a well known buffer in acidic conditions, it is expected to keep the pH relatively constant and thus keep the cidal activity of the acidic nitrite solution for two months or longer even twenty-four months. The 0.5 to 30% metal nitrite disclosed falls within the 0.01 to 1.0 range claimed herein. (Claim 12; Column 9).

The recitations, "the composition exhibits cidal activity against microorganisms for a period of two months after formulation," "wherein the cidal activity of the composition over a period of about twenty four months or more after formulation is comparable to the activity that it demonstrated initially," and wherein the cidal activity of the composition over a period of about five minutes or more after formulation is equivalent to the activity necessary to achieve an approximately eight log decrease in a sample of E.Coli" are considered functional recitations or inherent properties. The prior art compositions discussed above are expected to show such functional properties because they are deemed to be the same compositions comprising same ingredients.

Response to Arguments/ Amendments

Applicants' arguments filed 10/24/07 with respect to this rejection of claims 1-21 under 35 U.S.C. 102(b), of record in the previous Office Action have been fully considered but they are not deemed persuasive to render the claimed invention patentable over the prior art as further discussed below. Applicants reiterate the arguments of the previous office action. The responses to arguments filed 3/22/07 and 7/13/07 are reiterated.

Applicants argue that the differences between the teachings of Benjamin et. al. and the invention herein are "a low pH maximum" and "a range of nitrous acid/nitrite ratios". However, the pH claimed herein, "around 3.75" and "around 3.7" are considered to overlap with the pH disclosed in Benjamin. Furthermore, the nitrous acid/nitrite is a function of pH and it is not clear how that becomes different from Benjamin et. al. Since the Office does not have the facilities for preparing the claimed materials and comparing them with prior art inventions, the burden is on Applicant to show a novel or unobvious difference between the claimed product and the product of the prior art. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and *In re Fitzgerald.*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980).

Benjamin et. al. clearly contemplates the lowering of pH below 4 and the production of NO. (See Page 4, paragraphs 58-65). Applicants argue that there is no indication that an "acidified nitrite system" was employed. Benjamin et. al. notes that, " In a further form of the invention there is provided a sterilant

composition comprising a pharmaceutically acceptable acidifying agent, a pharmaceutically acceptable source of nitrite ions or a nitrate precursor therefor, and a pharmaceutically acceptable carrier or diluent therefor wherein the acidifying agent is adapted to reduce the pH at the environment of use to below pH4." (Page 4, paragraphs 61-63). Clearly, Benjamin et. al. contemplates and "acidified nitrite system". There reference is replete with discussions of NO gas production upon acidification.

The applicants argue that, "there is never a situation where a buffer solution, when absorbing the neutralizing influences of exogenous alkaline substances, will decrease in pH." In other words, pH will only increase if alkaline substances are added. The claims herein recite, "the pH of the composition is stabilized at an initial pH value of around 3.75 or decreases from said initial pH value of around 3.75 or lower at the time of formulation to a pH value as low as around 2.5 over a period of at least about two days". There is no mention of "exogenous alkaline substances" herein. The claims only recite "stabilized". If the buffer solution is to be in an exogenous acidic condition, the pH can stay the same or turn lower. It is elementary knowledge to one of ordinary skill in the art that when an alkaline substance is added pH can only go up, but when an acidic substance is added pH will only go lower. What applicants claim herein as a "system" amounts to a composition with the same ingredients as disclosed in Benjamin et. al. producing NO gas and used as an antimicrobial as in Benjamin et. al. The rejection under section 102(b) is still deemed proper and is adhered to.

Claim Rejections - 35 USC § 103

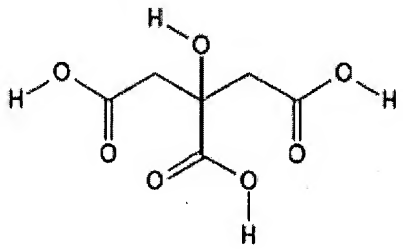
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et. al. (J. Appl. Micro. 2001, 90, 523-529; Of record), in view of Kross et. al. (U.S. Patent No.6,063,425) further in view of Benjamin et. al. (Of Record)

Xu et. al. discloses the use of nitrite in citric acid-phosphoric acid buffer (pH 3.3 and 2.5) as an antimicrobial agent. (Abstract and Page 524, Column 2, Paragraph 3). Xu et. al teaches that citric acid and nitrite are present in gastric juices and nitrite is present in saliva. (Page 524, Column 1, paragraph 1). Note that applicant defines "nitrite" or "nitrite salt" as a salt of nitrous acid. (Page 5, Second paragraph under "Detailed description of the invention). The specification shows the ratio of nitrous acid to nitrite under various pH conditions. (Table 1, Page 8). Specification shows that at pH 3.3, the ratio of nitrous acid to nitric acid is 1:1 (50% HNO_2 and 50% NO_2^-). (Table 1, Page 8). The ratio is 83.3 to 16.7 Nitrous acid:Nitrite at pH 2.3. (Table 1, Page 8). The protonation of dissolved nitrite ions under low pH conditions produces nitrous acid. Xu et. al. teaches that nitrite in pH 3.3 phosphate-citrate buffer has bactericidal effect against E-Coli. (Page 525, Column 2, Paragraph 1 and Table 1). Xu et. al. reports a reduction in E-Coli count on the log scale of 7.18 to less than 1 in 3

hours. (Table 1, 10mg Nitrite, Citrate-phosphate buffer). Xu et. al. further reports significant decreases in microbial count after treatment with nitrite solution in citrate-phosphate buffer at pH 2.5. (Page 526, Table 3). Even though Xu et. al. does not report the long term pH variability of the nitrite solution, it is expected to remain stable because citrate-phosphate is a strong buffer in acidic conditions. As such, the recitation "the pH of the composition either remains relatively constant at an initial value of around 3.75 or lower, or decreases from said initial value of around 3.75 or lower at the time of formulation to a value as low as around 2.5 over a period of at least about two days, preferably about two days to five days;" is considered a description of an inherent property of the nitrite solution in citrate-phosphorous buffer at pH 3.3. Since the composition is in a buffer, it is considered "stabilized". Note that citric acid (structure shown below) is has the alpha hydroxyl acid structure of claim 3.



Xu et. al. describes the use of agar which is considered as a thickener. (Page 524, Column 1, last paragraph). The buffer solution of Xu et. al. is considered an "application medium" recited in claim 7. Note that, the recitations "wherein the composition may be sprayed onto a substrate," "teat dip" and "wherein the composition is an oral rinse" are considered as intended uses of the composition. Note that it is well settled that "intended use" of a composition or product, will not

further limit claims drawn to a composition or product, so long as the prior art discloses the same composition comprising the same ingredients in an effective amount, as the instantly claimed. See, e.g., *Ex parte Masham*, 2 USPQ2d 1647 (1987) and *In re Hack* 114, USPQ 161.

Xu et. al. does not expressly disclose the use of metal nitrite in the ranges of 0.01 to 1.0 to generate nitrous acid or the composition in the form of a teat dip or gel or a gel with a thickener or the methods of disinfecting a substrate or method of disinfection of a substrate over a period of several months.

The disclosure of Benjamin et. al. is discussed above.

Kross et. al discloses the use of antimicrobial agents to disinfect meat carcass. (Abstract). Kross et. al. notes that "Thus, there is a continuing need for an effective and safe spray disinfectant to apply to animal carcasses soon after the evisceration process, before contaminating organisms can develop a firm foothold on the meat surfaces." Kross et. al. discloses the use of low pH antimicrobial agents containing citric acid. (Column 2, example 1). Kross et. al. further discloses the use of phosphoric acid with pKa of 2.15. (column 3, lines 40-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a metal nitrite, in particular ranges as claimed herein in a composition that comprise an alpha hydroxyl acid or phosphoric acid, both well known buffers to make a stabilized composition and to use said composition as disinfectant containing nitrite to clean surfaces because Xu et. al. discloses the usefulness of nitrites in low pH solutions as antibacterial agents and Kross et.

al. discloses the use of antibacterial agents to disinfect meat surfaces and Benjamin et. al. discloses the specific ranges of metal nitrites. One having ordinary skill in the art would have been motivated to do this because Kross et. al. discloses the need for effective and safe disinfectant and Xu et. al. teaches that nitrites are naturally present in gastric juices and saliva and are effective antibacterial agents. All the claimed steps herein are known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

As such one of ordinary skill in the art would have reasonably expected a composition comprising a metal nitrite and an alpha hydroxyl acid or phosphoric acid would have resulted in a stabilized solution with similar or better antimicrobial activity.

Response to Arguments/ Amendments

Applicant's arguments/amendments filed 24 October 2007 have been fully considered but they are not persuasive. Applicants reiterate the arguments of the previous office action. The responses to arguments filed 3/22/07 and 7/13/07 are reiterated.

Applicants argue that the very nature of buffers, specifically acid buffers is to maintain the pH of the system as to resist alkaline of pH raising factors, which may otherwise drive the pH higher in the direction of neutrality. Applicants

further argue that as the buffering capacity is consumed, the pH will rise rather than lower. The claims herein do not reflect an alkaline condition or addition of alkaline solutions. See discussion above in response to applicants arguments regarding increasing pH. The claims herein are directed to a composition and stability only refers to the functional inherent property of the composition. The intended use of the prior art references or that of the instant application do not further limit or distinguish the claims herein.

In response to applicants arguments regarding the ranges of metail nitrites, note that it is well settled that, merely selecting proportions and ranges is not patentable absent a showing of criticality. *In re Becket,* 33 USPQ 33 (C.C. P.A. 1937). *In re Russell*, 439 F.2d 1228, 169 U.S. P.Q. 426 (C.C. P.A 1971).

Applicants argue that the Kross reference is "inapposite" to the present invention. This argument was found unpersuasive since Kross reference achieves the same results herein by use of chlorite/chlorous acid system instead of nitrite/nitrous acid system. The role played by nitrous/nitrite herein is well recognized in the art as noted in Benjamin et. al. and Xu et. al, and it would have been obvious to one of ordinary skill in the art to use nitrous/nitrite in the same way as in Kross.

Applicants further argue that there is "absolutely no evidence that the full range of the Benjamin alkali metal compositions [i.e., 0.5-30%] would be capable of maintaining germicidal capability. However the range disclosed in Benjamin overlaps with the range claimed herein. If the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exits.

See *In re Woodruff,* 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir 1990). See MPEP § 2144.05 [4-1]. The rejection under section 103(a) is still deemed proper and is adhered to.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roy P. Issac whose telephone number is 571-272-2674. The examiner can normally be reached on 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on 571-272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

4/7/08

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